What is claimed:

1. A method of manipulating charged particles of a beam of charged particles by a magnetic field, the method comprising:

providing a magnetic field generating apparatus having a magnetic-flux-carrying body made of a material with a high permeability number, and at least one current conductor engaging at least partially around the magnetic-flux-carrying body, and

operating the magnetic-flux-carrying body at a operating temperature,

wherein the permeability number of the material is temperature dependent, and the material and the operating temperature are chosen such that the operating temperature is within a temperature range, in which the following applies:

$$\frac{\mu_{max} - \mu_{min}}{\mu_{max} \cdot \Delta T} = c, \text{ with } c < 3 \cdot 10^{-3}\ K^{-1}$$

wherein

μ_{max} is a maximum value of the permeability number in the temperature range,

μ_{min} is a minimum value of the permeability number in the temperature range, and

ΔT is a width of the temperature range.

2. The method according to claim 1, wherein c is less than $9 \cdot 10^{-4}$ K^{-1}.

3. The method according to claim 1, wherein c is less than $3 \cdot 10^{-4}$ K^{-1}.

4. The method according to claim 1, wherein c is less than $9\ 10^{-5}$ K^{-1}.

5. The method according to claim 1, wherein c is less than $3 \cdot 10^{-5}$ K^{-1}.

6. The method according to claim 1, wherein c is less than $9 \cdot 10^{-6}$ K^{-1}.

7. The method according to claim 1, wherein c is less than $3 \cdot 10^{-6}$ K^{-1}.

8. The method according to claim 1, wherein c is less than $1 \cdot 10^{-6}$ K^{-1}.

9. The method according to claim 1, wherein a temperature dependency of the material has an extremum in the temperature range.

10. The method according to claim 9, wherein the operating temperature is substantially a temperature at which the temperature dependency has the extremum.

11. The method according to claim 1, wherein the permeability number of the material is higher than 5,000.

12. The method according to claim 1, wherein the permeability number of the material is higher than 8,000.

13. The method according to claim 1, wherein the permeability number of the material is higher than 10,000.

14. A particle optical system having a particle-optical apparatus for providing a magnetic field for manipulating charged particles of a beam of charged particles, the particle-optical apparatus comprising:

a magnetic-flux-carrying body made of a material with a high permeability number,

at least one current conductor engaging at least partially around the magnetic-flux-carrying body, and

a temperature-adjusting unit configured for adjusting a temperature of the magnetic-flux-carrying body substantially to a nominal temperature,

wherein the permeability number of the material is temperature-dependent and the nominal temperature is within a temperature range, in which the following applies:

$$\frac{\mu_{max} - \mu_{min}}{\mu_{max} \cdot \Delta T} = c, \text{ with } c < 3 \cdot 10^{-3}\ K^{-1}$$

wherein

μ_{max} is a maximum value of the permeability number in the temperature range,

μ_{min} is a minimum value of the permeability number in the temperature range, and

ΔT is a width of the temperature range.

15. The particle-optical system according to claim 14, wherein a temperature dependency of the material exhibits an extremum in the temperature range.

16. The particle-optical system according to claim 15, wherein the nominal temperature is substantially a temperature at which the temperature dependency exhibits the extremum.

17. The particle-optical system according to claim 14, wherein the temperature-adjusting unit comprises a temperature sensor for detecting the temperature of the magnetic-flux-carrying body.

18. The particle-optical system according to claim 14, wherein the material is a soft-magnetic material.

19. The particle-optical system according to claim 14, wherein the material is a ferrite material.

20. The particle-optical system according to claim 14, wherein the system is a lithography system for transferring a pattern onto a particle-sensitive substrate using at least one writing beam of charged particles.

21. The particle-optical system according to claim 14, wherein the system is a microscopy system for inspecting an object.